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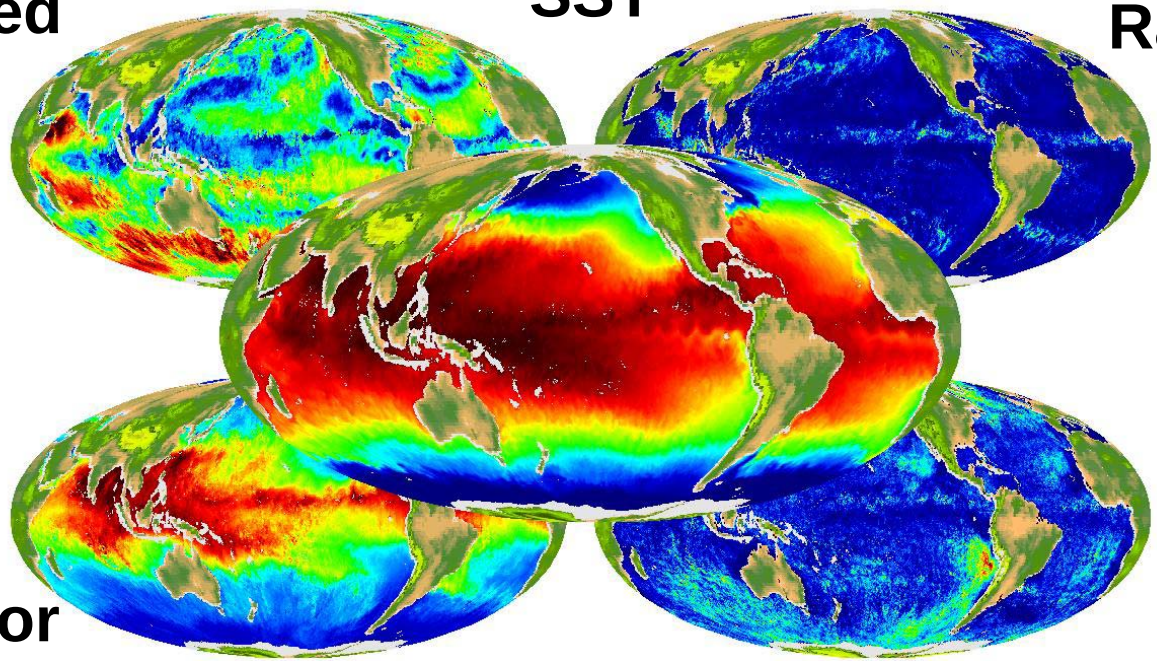
Science Coming from AMSR-E Ocean Products

Wind Speed

SST

Rain Rate



Water Vapor

Cloud

Presented at AMSR-E Science Team Meeting, Hawaii, Sept. 14, 2005
Credit: C. Gentemann, K. Hilburn, C. Mears, D. Smith, and F. Wentz

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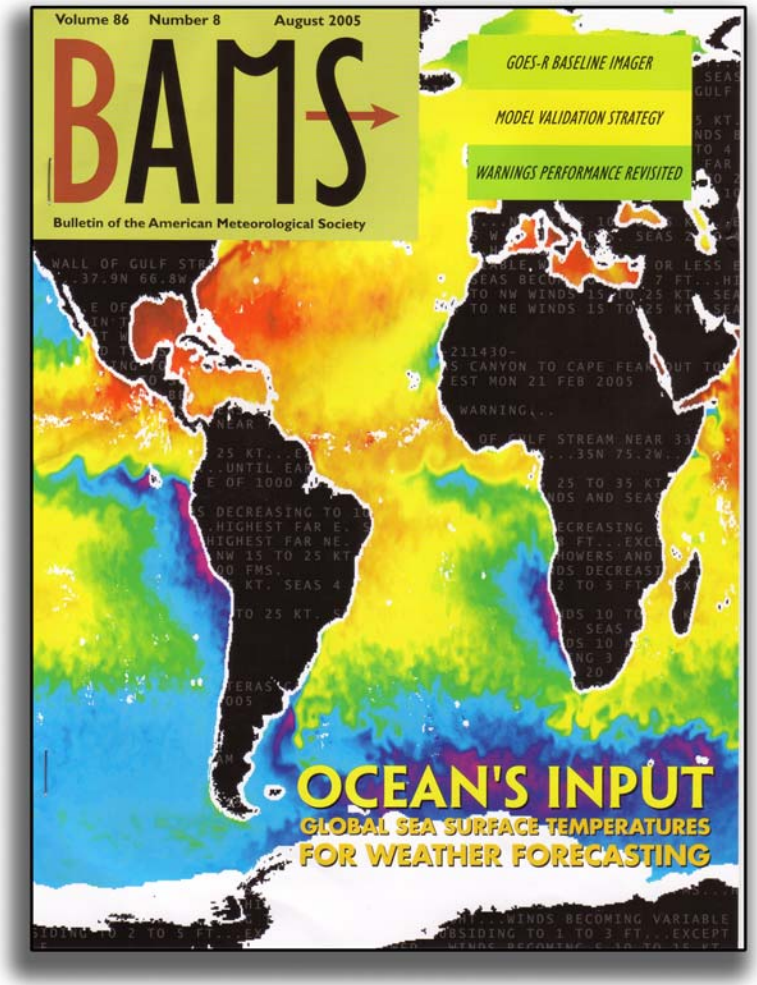
AMSR-E SST for Weather Prediction



Global Microwave Satellite Observations of Sea Surface Temperature for Numerical Weather Prediction and Climate Research Chelton and Wentz, BAMS, 2005.

AMSR-E SST would improve ECMWF and NCEP numerical prediction models, particularly in depicting the marine boundary layer model

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Katrina Sea Surface Temperature

Address http://svs.gsfc.nasa.gov/vis/a000000/a003200/a003222/index.html Go Links

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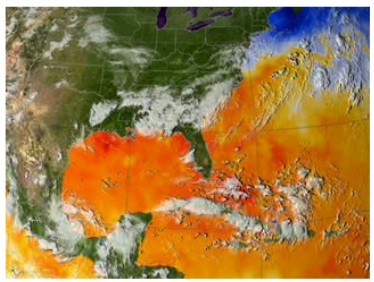
Hurricane Katrina Sea Surface Temperature

This visualization shows the cold water trail left by Hurricane Katrina. The data is from August 23 through 30, 2005. The colors on the ocean represent the sea surface temperatures, and satellite images of the hurricane clouds are laid over the temperatures to clearly show the hurricane positions. Orange and red depict regions that are 82 degrees F and higher, where the ocean is warm enough for hurricanes to form. Hurricane winds are sustained by the heat energy of the ocean, so the ocean is cooled as the hurricane passes and the energy is extracted to power the winds. The sea surface temperatures are 3-day moving averages based on the AMSR-E instrument on the Aqua satellite, while the cloud images were taken by the Imager on the GOES-12 satellite.

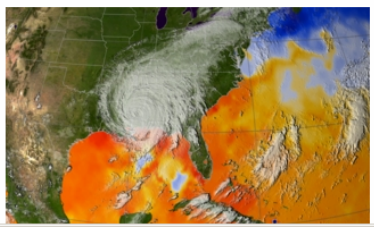


Sea surface temperature with cloud overlay

Available formats:

320 x 240	MPEG-1	1 MB
640 x 480	MPEG-1	6 MB
720 x 480	MPEG-2	10 MB
720 x 486	Frames	
720 x 486	Frames	
320 x 240	JPEG	4 KB

How to play our movies



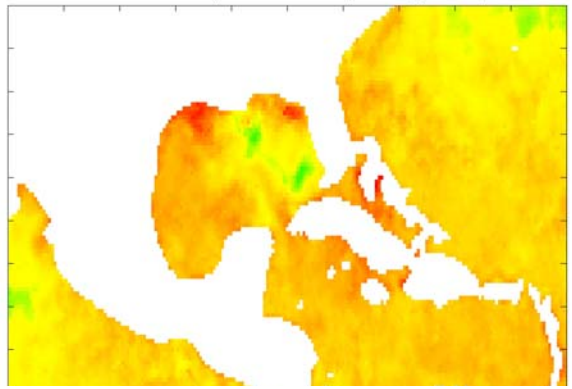
Sea surface temperature showing Hurricane Katrina's cold water wake in blues (08-29-2005)

Available formats:

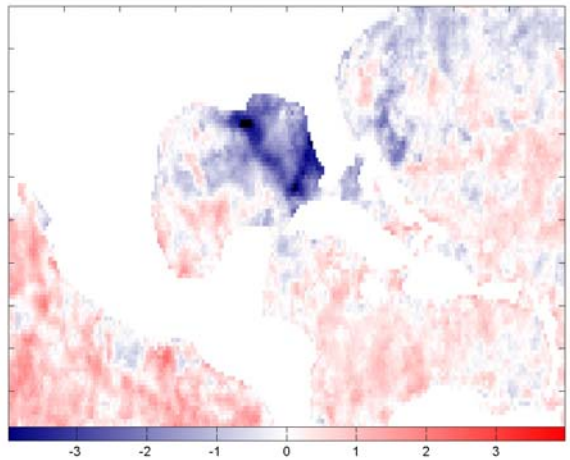
2560 x 1920	TIFF	1 MB
320 x 240	JPEG	7 KB
75 x 56	JPEG	533 B

Internet

RSS MW OI SSTs (TMI + AMSRE) on August 30, 2005



Katrinas cold wake



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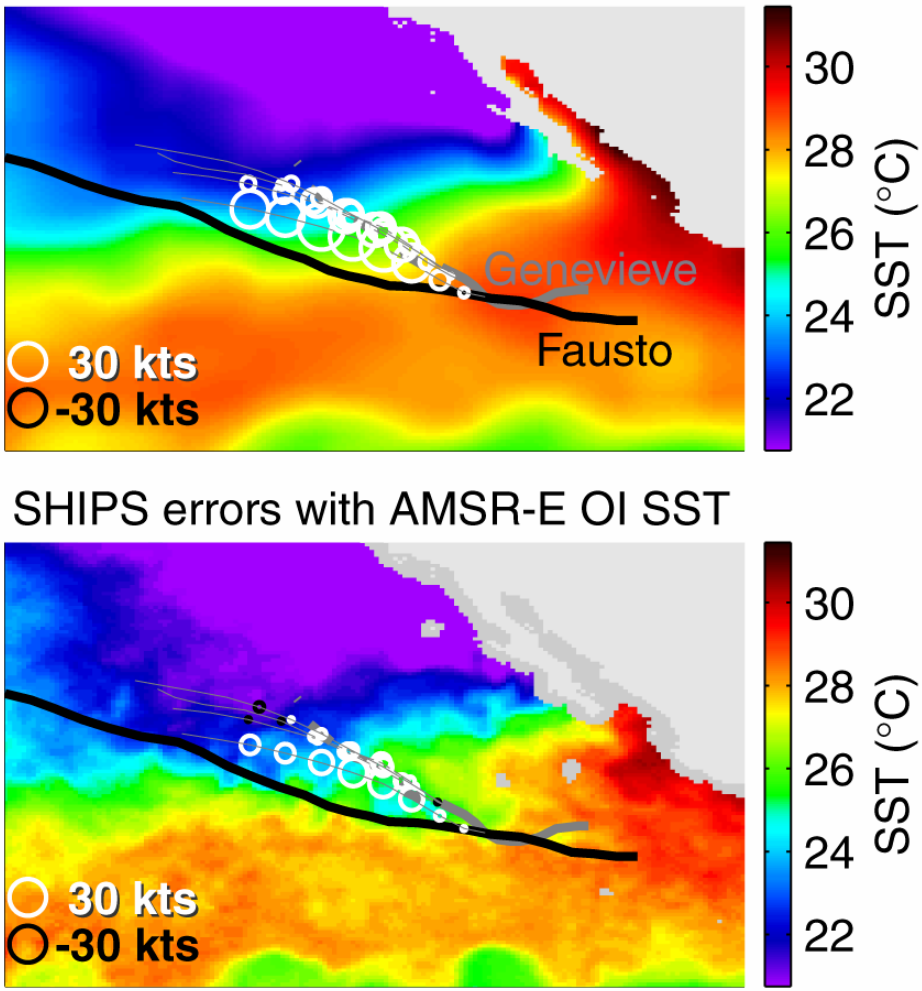
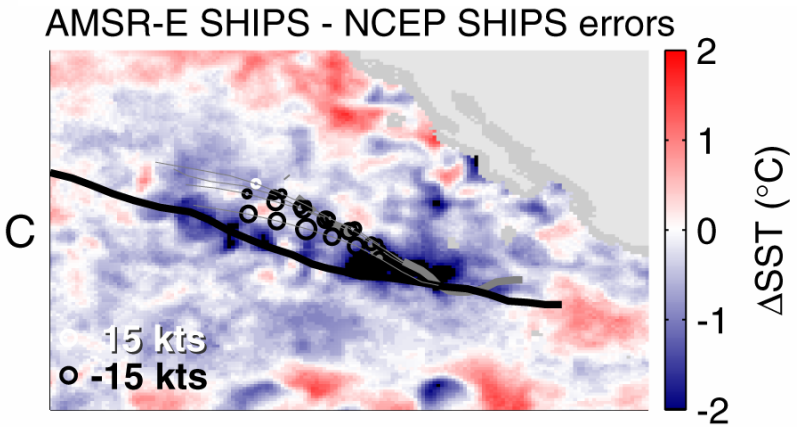
Hurricane Genevieve

SHIPS errors with NCEP OI SST



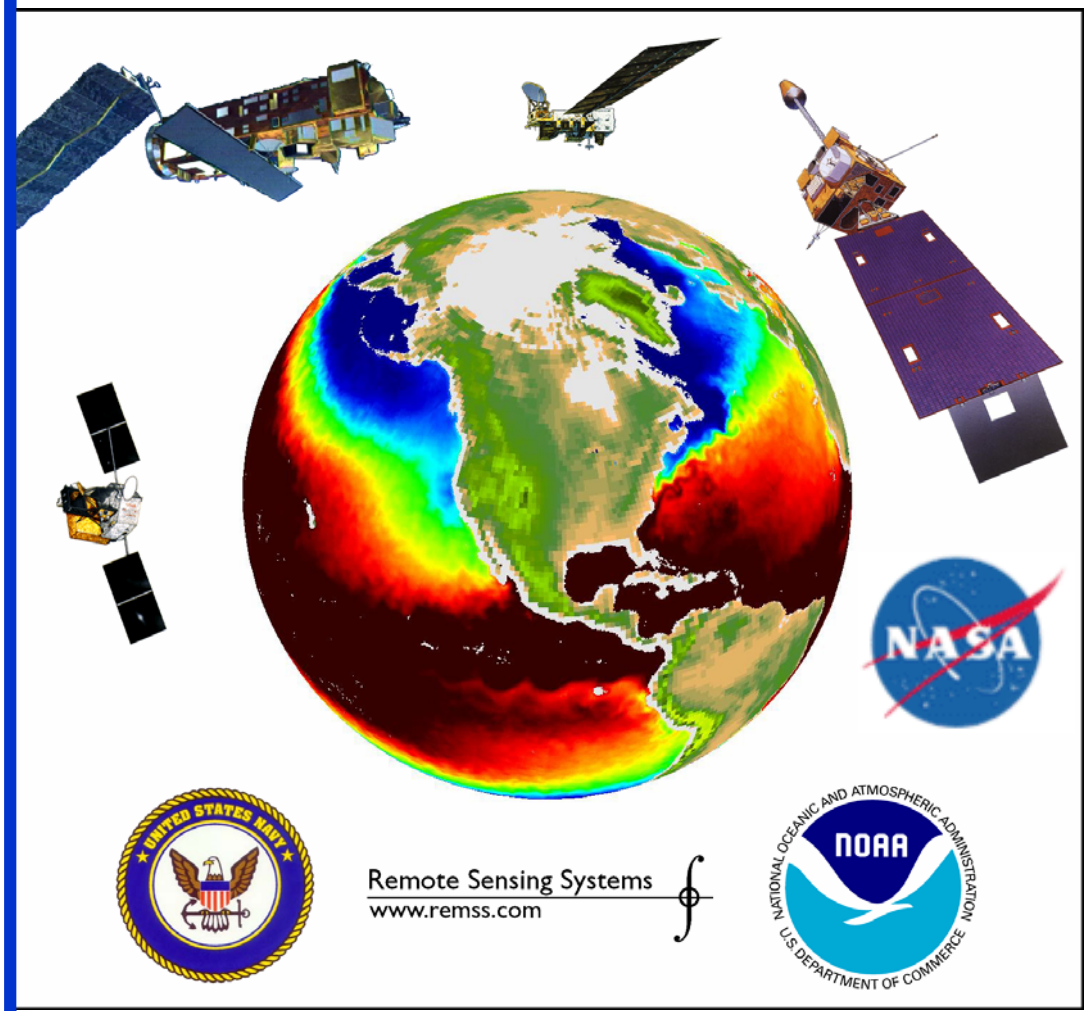
SHIPS errors with AMSR-E OI SST

AMSR-E SHIPS - NCEP SHIPS errors



New high-resolution NRT sea surface temperatures:

The Multi-sensor Improved SST (MISST) project



- Remote Sensing Systems
- NOAA
- US Navy
- NASA
- U. Maryland, U. Edinburgh, U. Miami, U. Colorado, WHOI
- I-GHRSST-PP Project Office

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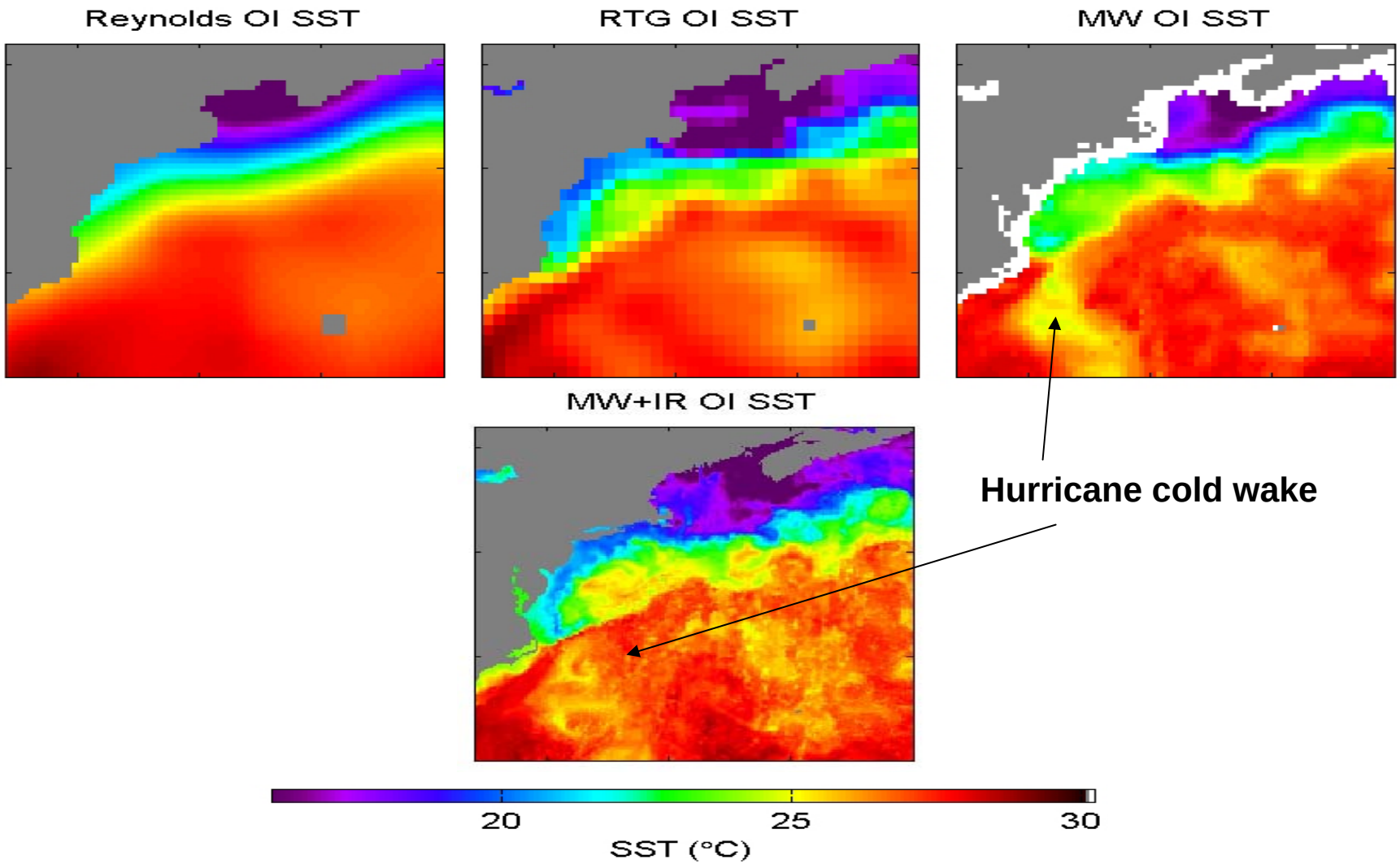
MW/IR OI SST



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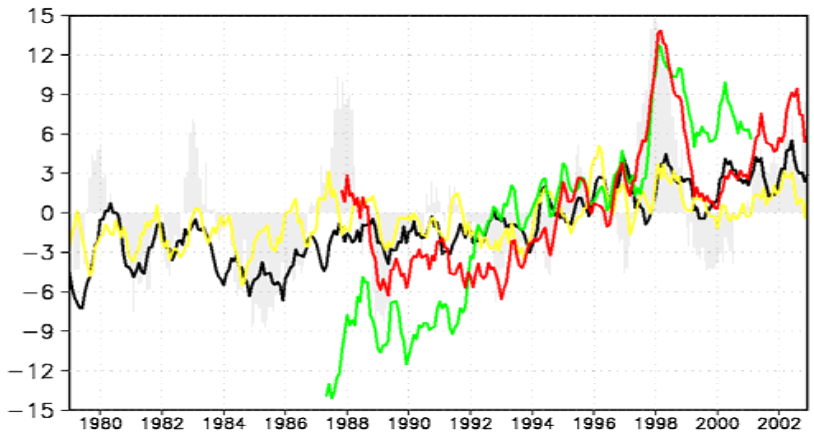
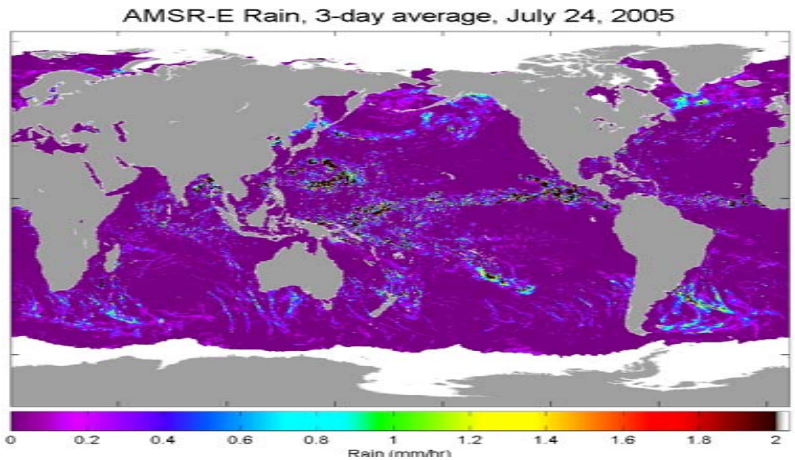
Balancing the Hydrological Cycle over the Ocean



Evaporation (Wind and Humidity)



Precipitation

- Balancing the P-E equation requires the Horizontal Advection of <u>Total</u> Water Vapor

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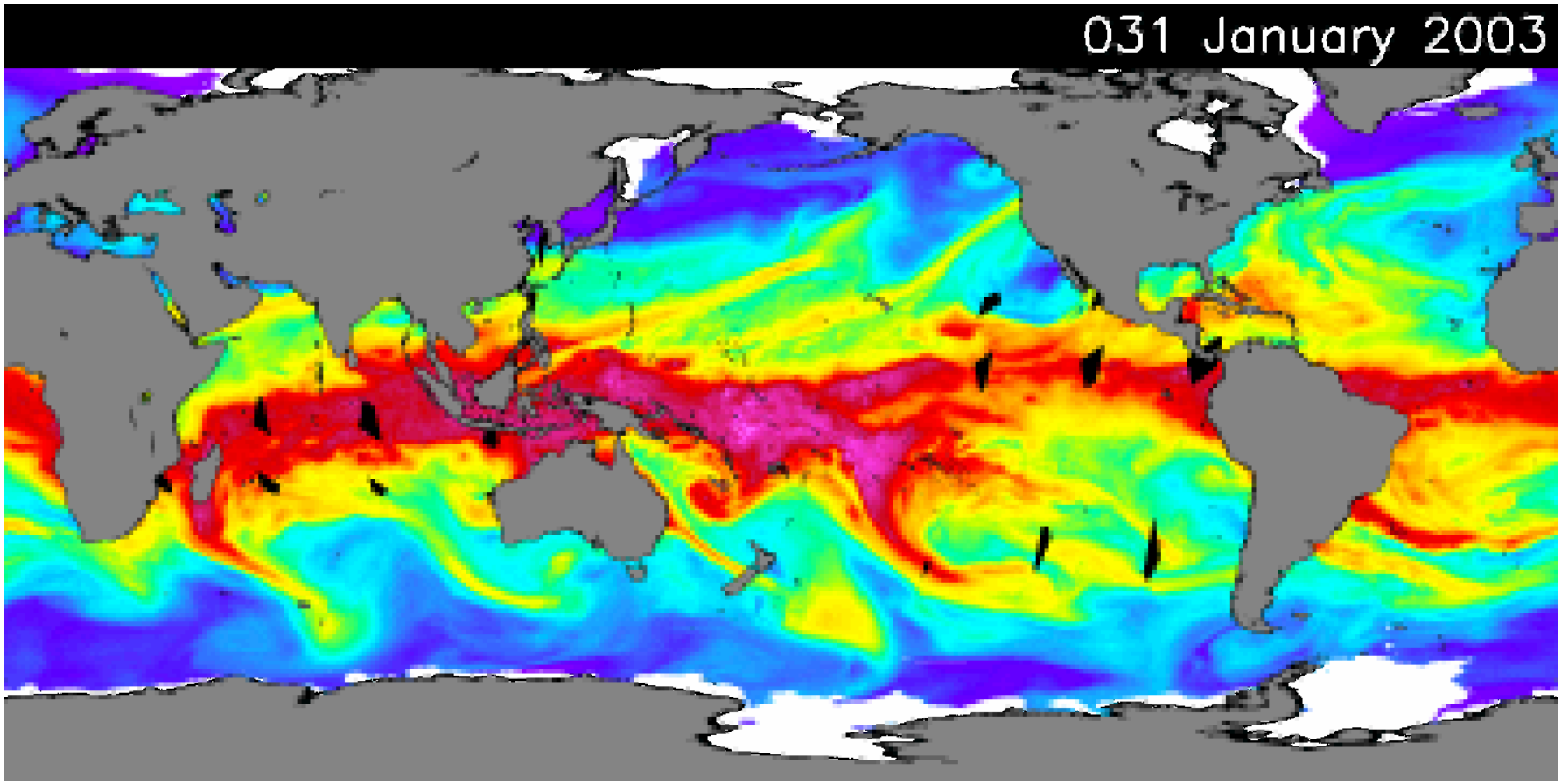
Estimating Water Vapor Transport Using a Multiple Satellite Network



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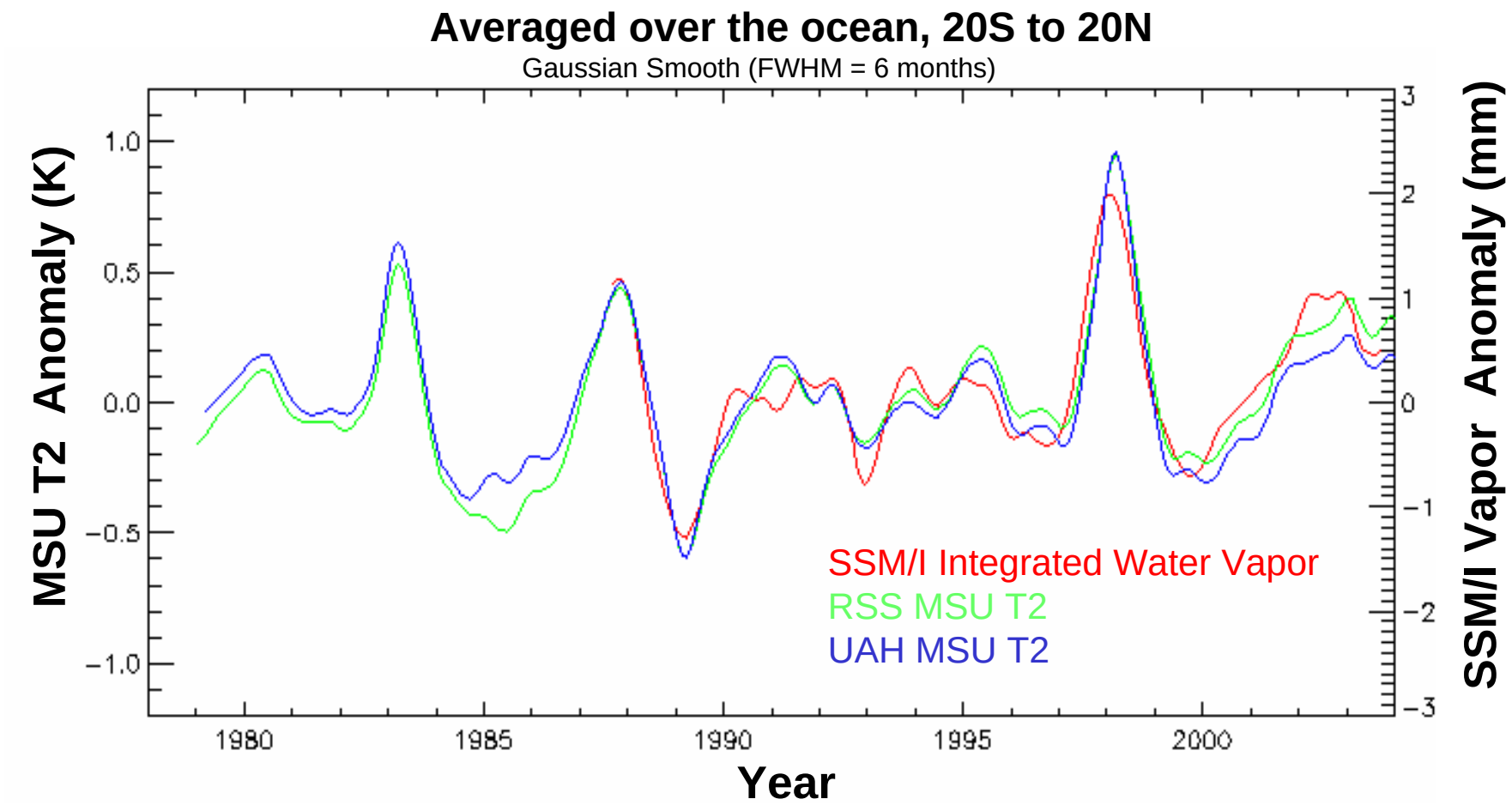
Correlation Between Vapor and MSU T2



Note scale factor: 1 K = 2.5mm (10%)

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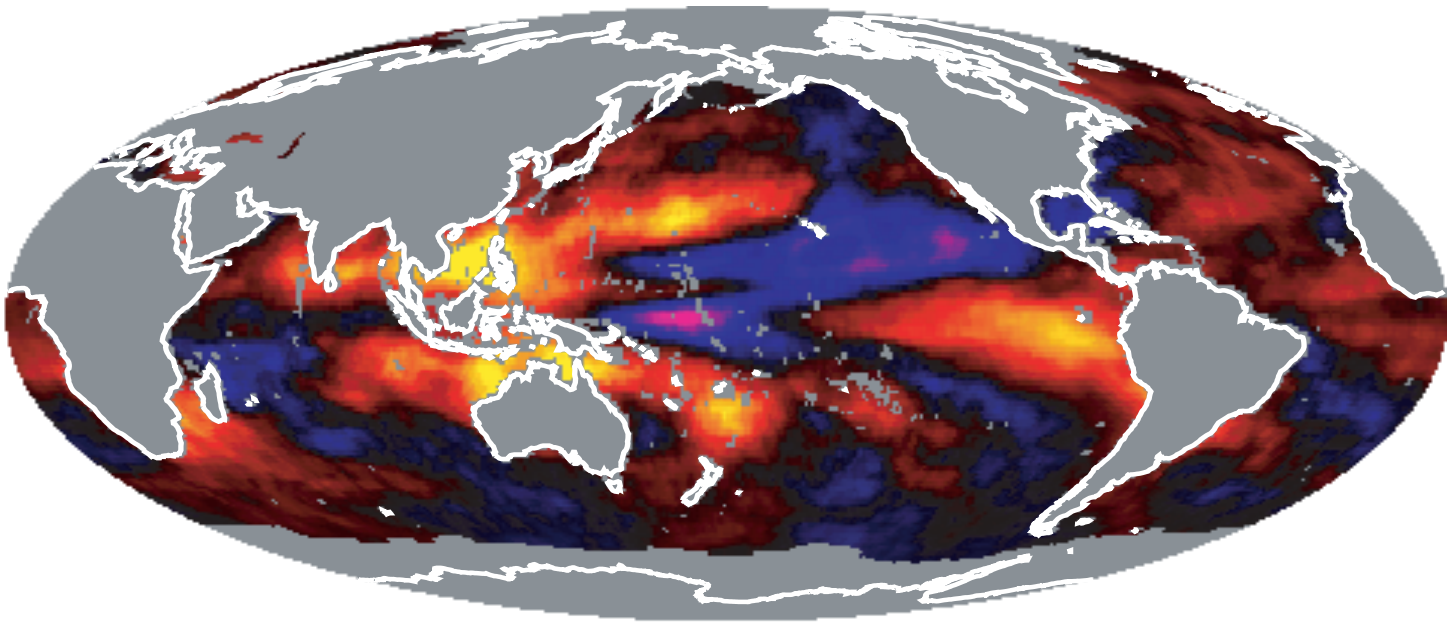
Vapor Trends



Linear Trend in Water Vapor, 1988-2001 (kg/m^2 per decade)

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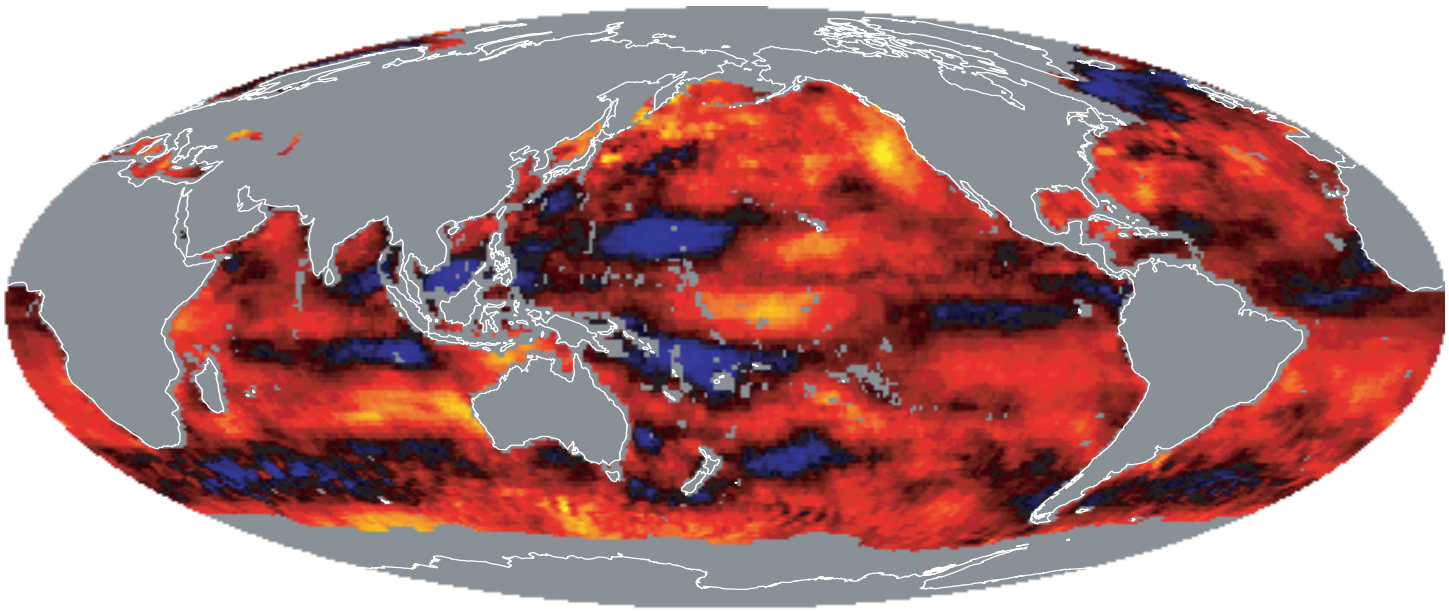
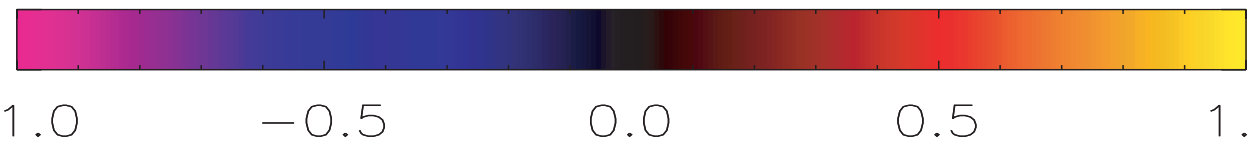
Wind Trends



Linear Trend in Wind Speed, 1988-2001 (m/s per decade)



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Validation, Validation, Validation

- **Daily collocation (within 6 hrs and 25 km) of satellite and FNMOC Near-realtime GTS buoy data set. Observations between 12PM and 4PM, with wind speeds less than 6 m/s are excluded from the dataset.**